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10/058157  
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In the United States Patent and Trademark Office

Serial No. \_\_\_\_\_

Appn. Filed : \_\_\_\_\_

Applicant: Vladimir Prutkin

Appn. Title: FILTERING MEMBRANES ON THE BASIS OF WELDED POLYMER  
STRUCTURES AND METHOD FOR MANUFACTURE THEREOF

Examiner/GAU: \_\_\_\_\_

Mailed: 27 Dec. 01

At: San Francisco, CA

Information Disclosure Statement  
Assistant Commissioner for Patents  
Washington, District of Columbia 20231

Sir:

Attached is a completed Form PTO-1449 and copies of the pertinent parts of the references cited thereon. Following are comments on references pursuant to Rule 98:

S. Loeb and S. Sourirajan describes in Publication of UCLA Dept. of Eng. Rep. 60-60 [1960] ) a membrane (hereinafter referred to as L-S membrane) and a method for desalination of sea water. The double-layered structure proposed by S. Loeb and S. Sourirajan is composed of a thin dense cellulose acetate film applied onto a thin porous substrate. The upper dense layer with a thickness not exceeding 1  $\mu\text{m}$  possessed selectivity to water and therefore allowed

isolation of sodium chloride therefrom. The porous substrate with a thickness exceeding 100  $\mu\text{m}$  imparted mechanical strength to the structure. Depending on their shapes, the membranes can be flat, spiral, tubular, or in the form of hollow fibers (First Demonstration of Reverse Osmosis by UCLA SEAS. See in Internet: <http://www.engineer.Ucla.Edu/history/osmosis.Html>).

A disadvantage of the L-S membrane consists in that only a part of the membrane volume is active, and the smaller the dimensions of pores, the smaller is the active volume of the membrane. The L-S method in principle does not allow to increase the amorphous part in the volume of the active zone of the membrane or to make it comparable with the membrane thickness and thus to improve permeability. This is an essential disadvantage of the L-S method. Another disadvantage of double-layered L-S membranes consists in that the porous substrate shields the active zone of the membrane and reduces its working area. The L-S membrane has a complicated construction and is difficult and expensive to manufacture.

US Patent No. 6,177,011 issued in 2001 to H. Hachisuka discloses a composite reverse osmosis membrane having a separation layer with polyvinyl alcohol coating.

US Patent No. 5,500,247 issued in 1996 to P. Hagqvist describes a web-like starting material formed by combining mutually two webs of membrane-layer carrier sheets and an intermediate web of the spacing layer or sheet.

Japanese Laid-Open Patent Application No. 2001-129329 issued in 2001 to K. Nagatsuka describes a reinforcing material for a polytetrafluoroethylene (PTFE) membrane filter which flame resistant and consists of a porous reinforced web and a thin PTFE film.

All membranes of the aforementioned patents have the same disadvantages as the Loeb membrane and differ from each other only by materials and by methods

of manufacture. The main feature of this membrane is a porous support structure for a thin The main feature of this membrane is a porous support structure for a thin membrane film or films on both sides of the support.

Thus, the cited reference does not disclose, as claimed in our independent Claim 1 with dependent Claims 2-19, a filtering membrane which consists of two overlapped films welded together with the formation of a plurality of cells interconnected through the welding seams having an amorphous structure and having having input openings on one side of the membrane and output openings on the other side of the membrane; the films can be crazed and the dimensions and composition of the crazes can be controlled. .Furthermore, the cited reference does not disclose a method of manufacturing the aforementioned membrane by imposing one thermoplastic film onto the other, if necessary, with crazing one or both films, providing one of the films with inlet openings and another film with outlet openings, and welding the films to each other with the formation of a plurality of cells interconnected through the welding seams of an amorphous structure.

Respectfully,

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FORM PTO-1449 (Substitute)

ATTY. DOCKET NO.

SERIAL NO.

## LIST OF PRIOR ART CITED BY APPLICANT

(Use several sheets if necessary)

APPLICANT

Vladimir Prutkin

FILING DATE

GROUP

10971 U.S. PTO

10/058157



## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AA	5,500,247	1996	P. Haggvist			
AB	6,177,011	2001	H. Hachisuka			
AC						
AD						
AE						
AF						
AG						
AH						
AI						
AJ						
AK						

## FOREIGN PATENT DOCUMENTS

AL	2001-129329	2001	Japan (K. Nagatsuka) (Kokai)			
AM						
AN						
AO						
AP						

## OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

AR	S. Loeb and S. Sourirajan	"Publication of UCLA Dept. of Eng. Rep. 60- [1960]				
AS						
AT						

EXAMINER

DATE CONSIDERED

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.